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(54) TERMINALS IN OR FOR ROTARY ELECTRIC MACHINES

(71) We, BULPITT & SONS LIMITED, a British Company of Albion Works, Albion Street, Birmingham B1 30L, do hereby declare the invention for which we pray that

a patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to terminals in or for rotary electric machines to which it is necessary to make external electrical connections through the shell of the machine.

Hitherto external electrical connections to such machines have been made by conventional screw terminals mounted in insulating bushes in the shell and having a screw-threaded portion extending radially outwards from the shell and fitted with nuts between which the cable connector is gripped. Such terminals are susceptible to breakage, particularly in transit.

An object of the present invention is to provide a terminal which is less vulnerable and is simpler and less costly.

The present invention consists in a terminal for a rotary electric machine comprising an electrically insulating sleeve capable of being tightly fitted in a splined hole through the shell of the machine and a bush made of metal of good electrical conductivity and having an externally splined portion adapted to be a tight fit in the bore of the sleeve, a screw-threaded axial hole in one end of the bush and fitted with a headed screw made of metal of good electrical conductivity and means at the other end of the bush for electrically connecting a conductor.

The invention comprises in a rotary electric machine a terminal comprising an electrically insulating sleeve tightly fitted in a splined hole through the shell of the machine, a bush made of metal of good electrical conductivity and having an ex-

ternally splined portion tightly fitted in the bore of the sleeve, a screw-threaded hole in and co-axial with that end of the bush which is on the outside of the machine and fitted with a headed screw made of metal of good electrical conductivity and means at the other end of the bush that is to say the end which is inside the machine for electrically connecting a conductor.

The bush need project very little from the shell and for transport the headed screw can be screwed right down or removed entirely so that the terminal is very much less vulnerable in transit than those of the conventional kind.

By "tightly fitting" is meant that the sleeve and bush, in normal conditions of use, are held against displacement, particularly in an axial direction. The splines afford additional resistance against turning of the bush under the torque imposed when the headed bolt is being tightened upon a cable connector in making external connections or is being released.

The insulating sleeve preferably initially has plain cylindrical internal and external surfaces and as the splines on the bush and in the hole in the machine will bite into these surfaces the material of which the insulating sleeve is made must have the necessary mechanical properties to withstand the stresses involved. One suitable material is a fabric-reinforced phenol-formaldehyde laminate such as that marketed under the Trade Mark "Tufnol".

Electrical connections inside the machine shell may also be made by a headed screw engaging a screw-threaded hole in the inner end of the bush. Alternatively the connection could be made in some other suitable manner, for example, the inner end of the bush could be provided with a slot or flat to which the internal wiring of the machine is brazed, welded or soldered.

The invention will now be described, by

way of example only, with reference to the accompanying drawings, in which,

Figure 1 is an exploded perspective view of a terminal according to the invention to be mounted in the shell of a rotary electric machine and,

Figure 2 is a section on the axis of the terminal of the completed assembly.

A shell 1 of a rotary electric machine has a radial hole 2 which is broached to form fine internal straight splines 3, for example 50 teeth in a hole of 5/8 inch in diameter. Into the splined hole 2 is pressed a plain sleeve 4 of insulating laminated material. Into the bore of the sleeve 4 is pressed a brass bush 5 having a medial portion 10 of slightly greater diameter than end portions 6 and 7 and formed by knurling with slightly tapering straight external splines commensurate with the internal splines 3. The sleeve 4 projects radially beyond the outer and inner surfaces of the shell 1 and the end portions 6, 7 of the bush project beyond the ends of the sleeve 4. There is an axial bore right through the bush. At the outer end 6 the bore is larger in diameter than at the inner end 7 and is screw-threaded to receive a headed brass screw 8 fitted with brass washers 11. The inner end is also screw-threaded and is fitted with a headed brass screw 9, smaller than the screw 8 and fitted with a washer 12.

The dimensions of the terminal may be altered for the current to be carried but in one typical example the headed screw 8 is 5/16 inch nominal diameter and the diameter at the root of the splines on the bush 5 is .500 inch. The tip diameter of the same splines is .508 inch but the initial internal bore of the insulating sleeve is .500 inch diameter. The initial external diameter of the sleeve is .626 inch to .627 inch while the hole 2 in the shell 1 before the splines are broached is .003 inch to .005 inch under 5/8 inch diameter.

WHAT WE CLAIM IS:—

1. A terminal for a rotary electric machine comprising an electrically insulating sleeve capable of being tightly fitted in a splined hole through the shell of the machine and a bush made of metal of good electrical conductivity and having an externally splined portion adapted to be a tight fit in the bore of the sleeve, a screw-threaded axial hole in one end of the bush and fitted with a headed screw made of

metal of good electrical conductivity and means at the other end of the bush for electrically connecting a conductor.

2. In a rotary electric machine a terminal comprising an electrically insulating sleeve tightly fitted in a splined hole through the shell of the machine, a bush made of metal of good electrical conductivity and having an externally splined portion tightly fitted in the bore of the sleeve, a screw-threaded hole in and co-axial with that end of the bush which is on the outside of the machine and fitted with a headed screw made of metal of good electrical conductivity and means at the other end of the bush that is to say the end which is inside the machine for electrically connecting a conductor.

3. A terminal according to Claim 1 wherein the insulating sleeve initially has plain cylindrical internal and external surfaces.

4. A terminal according to any preceding claim wherein the sleeve is made of a fabric-reinforced phenol-formaldehyde laminate.

5. A terminal according to any preceding claim wherein the electrical connecting means at said other end of the bush comprises a headed screw engaging a screw-threaded hole in and co-axial with said other end of the bush.

6. A terminal substantially as described herein with reference to, and as illustrated by, the accompanying drawings.

7. A method of fitting in a rotary electric machine a terminal according to Claim 1 or any of the preceding claims as appendant to Claim 1 comprising the steps of forming through a shell of the machine a splined hole the splines of which are smaller in internal diameter than the external diameter of the sleeve, pressing the sleeve into the hole and pressing the bush into the bore of the sleeve.

8. A rotary electric machine having a terminal fitted by the method of Claim 7.

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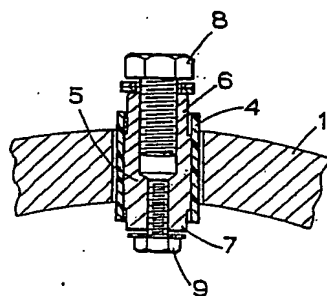


FIG. 2.

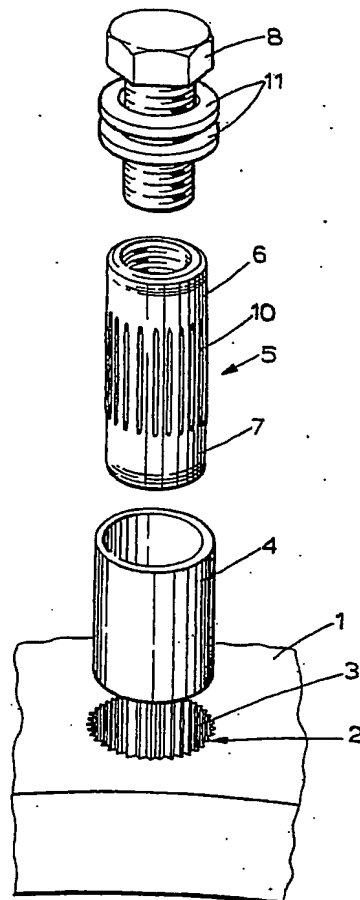


FIG. 1.

